

MARKED-UP VERSION OF THE AMENDED CLAIMS:

1. (currently amended) A diagnostic system for a modular fieldbus board carrying a number of IEC61158-2 fieldbuses connected to a bulk power supply, comprising a monitoring transceiver means connected in use to two or more of the number of fieldbuses in which each connection to a fieldbus comprises two or more signal injection and/or signal detection points, which points are collectively adapted to inject and/or detect both common mode and differential mode signals, and which points are located between the bulk power supply and a fieldbus trunk part of the fieldbus, such that the monitoring transceiver means can detect one or more fieldbus physical layer characteristics between two of the two or more of said points, and in which the monitoring transceiver means is provided with a first digital and/or analog interface separate from the fieldbus trunk, and adapted to transmit diagnostic data detected by the monitoring transceiver means directly to an associated digital or analog device .

2. (previously presented) A diagnostic system as claimed in Claim 1 in which the fieldbus physical layer characteristics comprise one or more of: over/under termination, noise/ripple level, signallevel, signal bias, signal jitter, signal ringing, signal distortion, signal attenuation, cross talk, unbalance, and earth leakage.

3. (previously presented) A diagnostic system as claimed in Claim 1 in which the monitoring transceiver means also detects one or more characteristics of hardware carried on the modular fieldbus board by means of one or more of said points.

4. (previously presented) A diagnostic system as claimed in Claim 3 in which the one or more characteristics of hardware comprise one or more of: voltage, short circuit, hardware module failure, quiescent current, and rate of charge.

5. (previously presented) A diagnostic system as claimed in Claim 4 in which the monitoring transceiver means is adapted to gather received data and produce one or more of: Fourier analysis, trending analysis, and data logging.

6. (previously presented) A diagnostic system as claimed in Claim 1 in which the monitoring transceiver means is adapted to provide an alarm in the event that received data indicates one or more of pre-determined failures has occurred on any of the two or more fieldbuses, and in which the first digital and/or analog

interface is adapted to transmit said alarm directly to an associated digital or analog device.

7. (previously presented) A diagnostic system as claimed in Claim 1 in which the first digital and/or an analog interface is adapted to receive operating commands an associated digital or analog device.

8. (previously presented) A diagnostic system as claimed in Claim 6 in which the monitoring transceiver means is provided with a second digital and/or an analog interface, such that diagnostic data detected and/or alarm created by the monitoring transceiver means during use are transmitted to other associated diagnostic systems.

9. (previously presented) A diagnostic system as claimed in Claim 6 in which the monitoring transceiver means is provided with visual means adapted to display diagnostic data detected and/or alarm created.

10. (canceled)

11. (previously presented) A diagnostic system as claimed in Claim 1 in which the monitoring transceiver means is connected to the bulk power supply.

12. (previously presented) A diagnostic system as claimed in Claim 1 in which one or more of the two or more signal injection and/or signal detection points are disposed within hardware carried on the board.

13. (previously presented) A modular fieldbus board comprising a number of fieldbuses connected to a bulk power supply, and a diagnostic system comprising a monitoring transceiver means connected to two or more of the number of fieldbuses by means of two or more signal injection and/or signal detection points, wherein the points are adapted to inject and/or detect both common mode and differential mode signals, and wherein the points are interposed between the bulk power supply and the fieldbus trunk, such that the monitoring transceiver means can detect one or more fieldbus physical layer characteristics between two of the two or more of said points.

14. (previously presented) A modular fieldbus board as claimed in Claim 13 in which each of the one or more fieldbuses comprise a connection to the bulk

power supply, a power supply converter, a power supply conditioner and a fieldbus trunk.

15. (previously presented) A modular fieldbus board as claimed in Claim 14 in which , on each of the one or more fieldbuses, a first common mode signal injection and/or signal detection point is disposed between the bulk power supply and the power supply converter, wherein a second common mode signal injection and/or signal detection point is disposed between the power supply converter and the power supply conditioner, in

which a third common mode signal injection and/or signal- detection point is the power supply conditioner and the field bus trunk, and a differential mode signal injection and/or signal detection point is disposed between the third common mode signal injection and/or signal detection point and the fieldbus trunk.

16. (previously presented) A modular fieldbus board as claimed in Claim 15 in which a fourth common mode signal injection and/or signal detection point is disposed within the power supply converter, and in which a fifth common mode signal injection and/or signal detection point is disposed within the power supply conditioner.

17. (previously presented) A diagnostics system as claimed in Claim 1 in which each of the two or more fieldbuses comprises a connection to the bulk power supply, a power supply converter and a power supply conditioner.

18. (previously presented) A diagnostic system as claimed in Claim 17 wherein, on each of the two or more fieldbuses, a first common mode signal injection and/or signal detection point is disposed between the connection to the bulk power supply and the power supply converter, wherein a second common mode signal injection and/or signal detection point is disposed between the power supply converter and the power supply conditioner, wherein a third a common mode signal injection and/or signal detection point is disposed between the power supply conditioner and the fieldbus trunk, and wherein a differential mode signal injection and/or signal detection point is disposed between the third common mode signal injection and/or signal detection point and the fieldbus trunk.

19. (previously presented) A diagnostic system as claimed in Claim 18 In which  
a fourth

common mode signal injection and/or signal detection point is  
disposed within the power supply converter, and in which a fifth  
common mode signal injection and/or signal detection point Is  
disposed within the power supply conditioner.

20. (currently amended) A modular fieldbus board comprising

a bulk power supply;

a plurality of IEC61158-2 fieldbuses including a fieldbus trunk and connected to  
the bulk power supply;

two or more signal injection and/or signal detection points, wherein the points  
are adapted to inject and/or detect both common mode and differential mode  
signals to the two wire pairing of each of the number of fieldbuses, and wherein  
the points are interposed between the bulk power supply and the fieldbus trunk;  
and

a diagnostic system comprising monitoring transceiver means connected to  
two or more of the plurality of fieldbuses by means of two or more signal  
injection and/or signal detection points, such that the monitoring transceiver

means can detect one or more fieldbus physical layer characteristics between two of the two or more of said points.

21. (new) A diagnostic system for a modular Fieldbus board carrying a number of IEC61158-2 Fieldbuses selected from the group consisting of Foundation Fieldbus H1, Profibus PA, IEEE 802 Ethernet, ITUG.99x.x DSL and mixtures thereof and connected to a bulk power supply, comprising a monitoring transceiver means connected in use to two or more of the number of Fieldbuses in which each connection to a Fieldbus comprises two or more signal injection and/or signal detection points, which points are collectively adapted to inject and/or detect both common mode and differential mode signals to a two wire pairing of each of the number of Fieldbuses, and which points are located between the bulk power supply and a Fieldbus trunk part of the Fieldbus, such that the monitoring transceiver means can detect one or more Fieldbus physical layer characteristics between two of the two or more of said points, and in which the monitoring transceiver means is provided with a first digital and/or analog interface separate from the Fieldbus trunk, and adapted to transmit diagnostic data detected by the monitoring transceiver means directly to an associated digital or analog device .